

The effect of the COVID-19 pandemic on daily routine and economic parameters of oral and maxillofacial surgery department

The effect of COVID-19 pandemic on maxillofacial surgery

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Abstract

Aim: The aim of the present study was to evaluate the effect of the pandemic regulations on clinics of the Oral and Maxillofacial Surgery Department.

Material and Methods: Patient data (age, gender, total patient number, total number of applied treatments and total income) between March 16 and June 1, 2020 were evaluated and compared with the records of the previous two years.

Results: Comparison of the number of patient treated showed a 90% decrease in 2020. In addition, the total number of applied treatment decreased by more than 90% in 2020. Additionally, the total income of the department decreased by 90% in 2020 compared to the previous two years.

Discussion: The SARS-CoV-2 virus can transmit from human to human via airborne droplets or aerosol. Therefore, the dentist and the staff of a dental clinic or department are more likely to be infected with SARS-CoV-2 than the staff of any other health discipline. The COVID-19 pandemic has affected all people around the world, socially, economically, and psychologically. Governments must be economically prepared for such a situation.

Keywords

COVID-19; Pandemic; SARS-CoV2; Oral surgery; Maxillofacial surgery

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Introduction

In December 2019, a viral disease in the city of Wuhan, the Hubei province, China causing symptoms similar to influenza was reported [1]. Scientists have declared that a member of the family of coronaviruses is responsible for this disease since it causes Middle East respiratory syndrome-(MERS-CoV) and severe acute respiratory syndrome- (SARS-CoV) like symptoms [2]. Following the announcement of the first death from the novel coronavirus disease 2019 (COVID-19) on January 9, 2020, the disease spread to Europe at the end of January [1]. As of June 3, 2020, COVID-19 has affected 6,287,771 people and caused 379,941 deaths all over the world [3]. The World Health Organization (WHO) declared the COVID-19 outbreak a pandemic on March 11, 2020 [3].

The National Pandemic Plan of Turkey was published by the Ministry of Health in 2006 [1]. After the additional experience gained during the 2009 Influenza A pandemic, the Pandemic Influenza National Preparedness Plan was developed and released [1].

Since the beginning of the COVID-19 outbreak, the General Directorate of Public Health (GDPH), a Department of the Ministry of Health, has closely monitored the process and formed a Scientific Board for managing COVID-19 in the country. The board worked in compliance with WHO recommendations [1]. After the first COVID-19 patient in Turkey was hospitalized on March 9, 2020 and died on March 17, 2020, the GDPH adapted the Pandemic Influenza National Preparedness Plan to COVID-19 response [1,2]. For this purpose, the Scientific Board of the Ministry of Health prepared guidelines, treatment algorithms, posters, and brochures in the light of current worldwide developments, and released them on the website of the Ministry of Health [1]. Following the recommendations of the Ministry of Health, the government of the Republic of Turkey announced restrictive measures including quarantine, travel restrictions, and curfew for people aged over 65 or under 20. In addition, curfew was imposed on specific provinces during weekends and throughout the country on public holidays, including the Ramadan Feast. Finally, the Ministry of Education closed schools and universities on March 16, 2020.

The Turkish healthcare system has also been affected by such emergency measures. Indeed, on April 21, 2020, the Ministry of Health issued rules for dental practices valid during the pandemic [1], thereby forbidding the treatment of patients except for urgent cases. Therefore, during the pandemic, only trauma treatments, pulpitis, maxillofacial abscess, pericoronitis, temporomandibular joint dislocations and dental issues of cancer patients, together with biopsies, were carried out. These regulations caused a decrease in the number of patients calling on dental clinics or faculties for dental examinations and treatments.

Eventually, on May 28, 2020, the President of the Republic of Turkey announced a normalization plan to be implemented from June 1, which would ease pandemic restrictions.

The aim of this study was to investigate the effect of pandemic regulations in terms of patient numbers, the daily number of clinic-based treatments, and age and gender distribution of patients in the faculty clinics of the Department of Oral and Maxillofacial Surgery between March 16 and June 1, 2020, and

to compare these statistics to the same period of the previous two years.

Material and Methods

The design of the study was approved by the Local Ethical Committee for Clinical Research of the Erciyes University (2020/268). Data were collected from patients treated during the time of pandemic restrictions, i.e., between the first day when the pandemic regulations were adopted (March 16, 2020) and the first day of normalization (June 1, 2020). Data were then classified by age, gender, the total number of treated patients, the total number of procedures performed, and total income. The most common clinical procedures were selected from the list of the Ministry of Health and classified as follows: 1) tooth extraction with infiltrative anesthesia (TEwIA), 2) tooth extraction with regional anesthesia (TEwRA), 3) complicated tooth extraction with infiltrative anesthesia (CTEwIA), 4) complicated tooth extraction with regional anesthesia (CTEwRA), 5) dental implant placement (DIP), 6) examination of temporomandibular joint disorders (eTMD), 7) impacted tooth extraction with mucosal retention (ITEwMR), and 8) impacted tooth extraction with bone retention (ITEwBR). In addition, the most commonly performed procedures under general anesthesia were classified as 1) sagittal split ramus osteotomy (SSRO) and 2) Le Fort 1 osteotomy.

The same data have been collected for a period of the last two years (2018 and 2019) including the same number of working days as 2020 as well as the holy month of Ramadan. The Ramadan is a 30-day period in which all believers must fast between dawn and dusk. Since religious precepts forbid eating and drinking, believers cannot undergo dental care during this time. Therefore, in recent years the number of patients has decreased during Ramadan. To account for this bias, since the time of pandemic restrictions covered the holy month of Ramadan in 2020, the same number of days, including Ramadan, were selected from the previous two years.

The Pearson chi-square test was performed using the SPSS software (Version 22.0. Armonk, NY: IBM Corp.) and $p < 0.05$ was considered as the threshold for statistical significance.

Results

There were 46 working days between March 16 and June 1, excluding public holidays and the Ramadan Feast.

In 2018, 2732 patients were under 20 years of age, 4614 patients were between 20-65 years of age, and 362 patients were above 65 years of age. In 2019, 2564 patients were under 20 years of age, 3896 patients were between 20-65 years of age, and 356 patients were above 65 years of age and in 2020; 174 patients were under 20 years of age, 428 patients were between 20-65 years of age, and 27 patients were above 65 years of age. Comparison between the years of 2018-2020 ($p < 0.05$) and 2019-2020 ($p < 0.05$) showed a statistically significant difference (Table 1).

In 2018, 3,914 male and 4,514 female patients (7,708 in total) were treated in the departmental clinic, while in 2019 there were 2,877 male and 3,939 female patients (6,816 in total), and in 2020 there were 300 male and 329 female patients (629 in total). Statistical analysis showed significant differences in the

Table 1. Age distribution throughout the years.

	2018	2019	2020
0-20	2732	2564	174
20-65	4614	3896	428
65+	362	356	27
Total	7708	6816	629

Table 2. Gender distribution throughout the years.

	2018	2019	2020
Male	3194	2877	300
Female	4514	3939	329
Total	7708	6816	629

Table 3. Distribution of the performed procedures throughout the years

	2018	2019	2020
TEwIA	5847	5739	252
TEwRA	2551	2660	154
CTEwIA	575	171	24
CTEwRA	307	312	21
Total	9280	8882	451
DIP	130	480	12
eTMD	439	349	10
ITEwMR	800	418	9
ITEwBR	648	449	10
Total	1448	867	19
SSRO	14	16	1
LeFort 1 Osteotomy	10	9	0

TEwIA: Tooth Extraction with Infiltrative Anesthesia, TEwRA: Tooth Extractions with Regional Anesthesia, CTEwIA: Complicated Tooth Extractions with Infiltrative Anesthesia, CTEwRA: Complicated Tooth Extractions with Regional Anesthesia, DIP: Dental Implant Placement, eTMD: Examination of Temporomandibular Joint Disorders, ITEwMR: Impacted Tooth Extraction with Mucosa Retention, ITEwBR: Impacted Tooth Extraction with Bone Retention, SSRO: Sagittal Split Ramus Osteotomy

number of patients between 2018 and 2020 as well as between 2019 and 2020 ($p < 0.05$). In addition, 5,847 TEwIA, 2,551 TEwRA, 307 CTEwIA, and 307 CTEwRA (9,280 tooth extractions in total) were performed in 2018, while 5,739 TEwIA, 2,660 TEwRA, 171 CTEwIA, and 312 CTEwRA (8,882 in total) were performed in 2019, and 252 TEwIA, 154 TEwRA, 24 CTEwIA, and 21 CTEwRA (451 in total) were performed in 2020. Statistical analysis showed significant differences in the number of tooth extractions between 2018 and 2020 as well as between 2019 and 2020 ($p < 0.05$). Furthermore, 800 ITEwMR and 648 ITEwBR (1,448 impacted tooth extractions in total) were performed in 2018, while 418 ITEwMR and 449 ITEwBR (867 in total) were performed in 2019, and 9 ITEwMR and 10 ITEwBR (19 in total) were performed in 2020. Statistical analysis showed significant differences in the number of impacted tooth extractions between 2018 and 2020 as well as between 2019 and 2020 ($p < 0.05$). Also, 439, 349, and 10 eTMD were performed in 2018, 2019, and 2020, respectively. Statistical analysis showed significant differences in the number of eTMD between 2018 and 2020 as well as between 2019 and 2020 ($p < 0.05$). Considering the surgical procedures performed under general

anesthesia, 10 Le Fort 1 and 14 SSRO in 2018, 9 Le Fort 1 and 16 SSRO in 2019 and 1 SSRO were performed in 2020. Finally, 130, 480, and 12 DIP were performed in 2018, 2019, and 2020, respectively. The total income of the department was calculated and compared between the years 2018, 2019, and 2020. As expected, the total income decreased by 90% in 2020 as compared to the previous two years.

Discussion

The objective of the present study was to evaluate the effect of pandemic restrictions on the daily routine of the clinic of the Department of Oral and Maxillofacial Surgery. COVID-19 was reported as an infectious viral disease originated in the city of Wuhan, China [1] that produced symptoms similar to those of MERS-CoV and SARS-CoV [2]. During the initial diffusion of COVID-19, between December 2019 and March 2020, the disease spread to Europe and the USA. On March 11, the WHO declared COVID-19 a worldwide pandemic [3]. The first COVID-19 patient in Turkey was hospitalized on March 9 and died on March 17, 2020. The Ministry of Health monitored the process from the initial diagnosis and took immediate action to limit the spread of the disease in Turkey. The prompt establishment of restrictions such as curfew (even during the holy month of Ramadan), the shutdown of schools and universities, travel restrictions, border closures, as well as the supply of personal protective equipment (PPE) for all citizens (masks) and healthcare providers (N95 masks, goggles, and overalls), and other efforts helped Turkey to reduce the impact of the pandemic. Indeed, Meleti et al. reported that in Italy, as of May 7, 215,858 people had been infected and 29,981 had died from COVID-19 [6]. On the other hand, only 133,721 infections and 3,641 deaths were recorded in Turkey as of May 7. Research on SARS-CoV-2 pathogenesis showed that the virus can transmit from human to human via airborne droplets or aerosol and survive on different surfaces for up to 14 hours [4]. Routine daily dental procedures, such as caries removal, root canal treatment, impacted tooth extraction under irrigation, dental implant placement, or tooth preparation, create abundant aerosol, which can spread into the clinical environment. Therefore, considering the life span of SARS-CoV-2 on different surfaces, the staff of a dental clinic or department is more prone to be infected with SARS-CoV-2 than the staff of any other health discipline [5]. On April 21, the Ministry of Health announced restrictive rules for dental procedures: only urgent treatments such as acute abscess, maxillofacial trauma, pericoronitis, and treatments of oncology patients were allowed. In addition, the scientific board set hygiene protocols for dental clinics, including rules on disinfection of the clinic environment, waiting times between patients, organization of the waiting room, and the use of PPE [1]. Along with these regulations and the curfew, patients' fear of infection has caused a decrease in the number of daily treated patients in dental clinics. For instance, Meleti et al. reported that in a month, on average, only three patients were treated daily in the clinics of the province of Parma [6]. In the present study, we showed that the total number of patients in a Turkish dental clinic dramatically decreased during the time

of pandemic restrictions compared to the last two years. In addition, the number of routine daily treatments decreased by 90%.

The mandatory pandemic restrictions caused economic hardship in Turkey as well as in all other countries of the world. In Turkey, the health insurance of most citizens is covered by the government. Therefore, a great percentage of patients' healthcare costs are covered by the government in case of treatment in public clinics, hospitals, and faculties. As a consequence, public hospitals in Turkey are economically dependent on the government. Hence, the current decrease in patient numbers has caused economic problems for public healthcare providers. In the present study, we found that the total department income and the total faculty income decreased by 90% and more than 90%, respectively. Most of the procedures that were allowed to be performed in dental clinics were covered by the Department of Oral and Maxillofacial Surgery. During the pandemic restrictions, only the clinics of the Department of Oral and Maxillofacial Radiology, the Department of Pediatrics, and the Department of the Oral and Maxillofacial Surgery were on duty. This was the reason for the difference in the income decrease between the department and the faculty.

One of the main activities of the faculties is the education of resident physicians. The decrease in patient numbers and the limitation of treatments to the urgent ones caused inadequacy in the theoretical and practical education of oral and maxillofacial surgery residents. Online education has been applied during the time of pandemic restrictions, but it cannot replace face-to-face education. In Turkey, in particular, residents may be required to make up for the lost days of practical education by extending their training period.

Conclusion

The COVID-19 pandemic has affected all people around the world, socially, economically, and psychologically. Governments must be economically prepared for such a situation. A plan to encourage new opportunities should be prepared to overcome the possible negative effects of the pandemic. Also, governments must support healthcare workers, the front-line warriors of this pandemic, both economically and psychologically.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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